1. Solve the modeling problem below, if possible.

   A new virus is spreading throughout the world. There were initially 8 many cases reported, but the number of confirmed cases has quadrupled every 3 days. How long will it be until there are at least 1000000 confirmed cases?

   A. About 12 days

   B. About 26 days

   C. About 36 days

   D. About 14 days

   E. There is not enough information to solve the problem.

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2. Solve the modeling problem below, if possible.

   A new virus is spreading throughout the world. There were initially 7 many cases reported, but the number of confirmed cases has quadrupled every 4 days. How long will it be until there are at least 1000 confirmed cases?

   A. About 15 days

   B. About 20 days

   C. About 10 days

   D. About 9 days

   E. There is not enough information to solve the problem.

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3. For the scenario below, use the model for the volume of a cylinder as $V = \pi r^2 h$.

   Pringles wants to add 41 percent more chips to their cylinder cans and minimize the design change of their cans. They've decided that the best way to minimize the design change is to increase the radius and height by the same percentage. What should this increase be?

   A. About 20 percent

B. About 19 percent

C. About 3 percent

D. About 12 percent

E. None of the above

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4. Using the scenario below, model the population of bacteria α in terms of the number of minutes, t that pass. Then, choose the correct approximate *(rounded to the nearest minute)* replication rate of bacteria-α.

   A newly discovered bacteria, α, is being examined in a lab. The lab started with a petri dish of 4 bacteria-α. After 3 hours, the petri dish has 19753 bacteria-α. Based on similar bacteria, the lab believes bacteria-α triples after some undetermined number of minutes.

   A. About 14 minutes

   B. About 227 minutes

   C. About 88 minutes

   D. About 37 minutes

   E. None of the above

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5. Solve the modeling problem below, if possible.

   In CHM2045L, Brittany created a 28 liter 34 percent solution of chemical χ using two different solution percentages of chemical χ. When she went to write her lab report, she realized she forgot to write the amount of each solution she used! If she remembers she used 20 percent and 36 percent solutions, what was the amount she used of the 36 percent solution?

   A. $24.50 liters$

   B. $3.26 liters$

   C. $3.50 liters$

   D. $14.00 liters$

E. There is not enough information to solve the problem.

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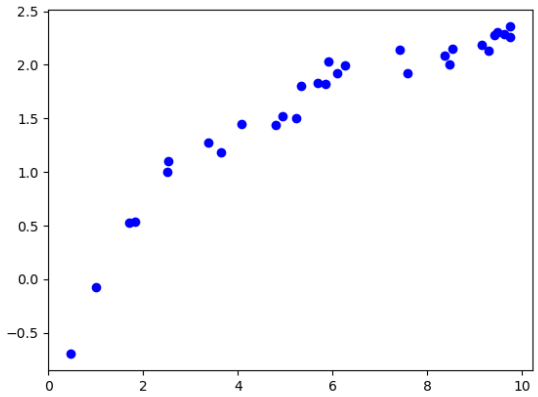
6. Determine the appropriate model for the graph of points below.



A. Linear model

B. Logarithmic model

C. Exponential model

D. Non-linear Power model

E. None of the above

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7. For the information provided below, construct a linear model that describes the total distance of the path, D, in terms of the time spent on a particular path *if we know that the time spent on each path was equal.*

A bicyclist is training for a race on a hilly path. Their bike keeps track of their speed at any time, but not the distance traveled. Their speed traveling up a hill is 6 mph, 10 mph when traveling down a hill, and 8 mph when traveling along a flat portion.

A. $0.392t$

B. $480t$

C. $24t$

D. The model can be found with the information provided, but isn't options 1-3

E. The model cannot be found with the information provided.

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8. For the scenario below, use the model for the volume of a cylinder as $V = \pi r^2 h$.

Pringles wants to add 30 percent more chips to their cylinder cans and minimize the design change of their cans. They've decided that the best way to minimize the design change is to increase the radius and height by the same percentage. What should this increase be?

A. About 15 percent

B. About 14 percent

C. About 9 percent

D. About 3 percent

E. None of the above

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9. Solve the modeling problem below, if possible.

In CHM2045L, Brittany created a 27 liter 27 percent solution of chemical χ using two different solution percentages of chemical χ. When she went to write her lab report, she realized she forgot to write the amount of each solution she used! If she remembers she used 16 percent and 37 percent solutions, what was the amount she used of the 16 percent solution?

A. $13.39 liters$

B. $12.86 liters$

C. $13.50 liters$

D. $14.14 liters$

E. There is not enough information to solve the problem.

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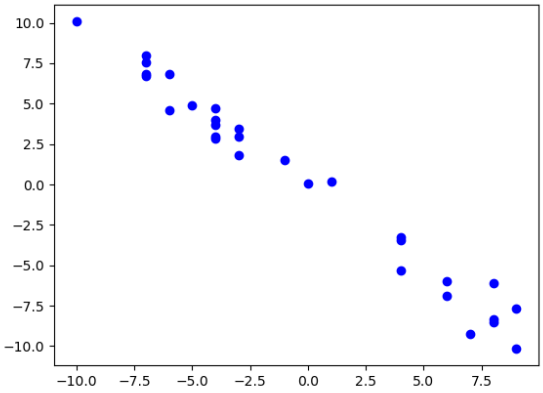
10. Determine the appropriate model for the graph of points below.



A. Non-linear Power model

B. Linear model

C. Exponential model

D. Logarithmic model

E. None of the above
